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THE HYGIENE OF EXPOSURE.

BEING THE

ADDRESS IN HYGIENE,

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PREVENTIVE medicine is of ancient origin. The father of the science embodied in the title of one of his works the three great influences that affect health, *the air*, *the water*, *and the place*. The perfect service, however, of the physician, both in the prevention and cure of diseases has been greatly abridged in times past, by erroneous theories As long as the ills that flesh is heir to were regarded either as special visitations of Providence, or as the result of the malign influences of witchcraft and magic, preventive and curative measures were alike unsatisfactory. Overwhelmed by epidemics, the devout communities of former times have sought relief, not in hygienic measures or scientific treatment, but in prayers and penance, or, in more barbarous times and places, by sacrifices and votive offerings. We have at last passed beyond these errors, and not only have scientific men recognized disease as the natural result of infringement of natural laws; but, what is more important to the success of legitimate hygiene, the general truth of this view has been admitted by the less educated community. The sanitarian is not obliged to pursue his work under the opposition of the multitude, but he receives fair encouragement. In spite, however, of the progress that has been made, we are still the slaves of opinions that are honorable only for their antiquity, and we are startled by dangers as imaginary as those of witchcraft; we waste our energies

in combating harmless influences while the true causes of disease are left unnoticed.

The last few years have witnessed the most energetic researches into the causation and communication of disease. The germ theory, which a little over a decade ago was a mere whispered hypothesis, accepted more on account of its plausibility, and for want of other definite views, has become, under the labors of Pasteur, Tyndall, Koch, Formad, and many others, almost like the atomic hypothesis in chemistry, or the undulatory theory of light, an authoritative dogma demanding general acceptance. The gentleman upon whom devolved last year the duty of presenting the address in hygiene, gave the Society a lucid account of the nature of germs; and since that meeting the claims of Koch to the discovery of the cause of phthisis has been put forward. Investigators are, however, not unanimous in their acceptance of these recent views, and we may, I think, safely leave the discussion of them to the experts, content to accept the correct view when it has been determined for us. We may do this all the more willingly if we reflect that the conservation of public health can be secured upon principles not dependent on any theory, but based on the extended experience of mankind. Whether we believe with one school that infectious and contagious diseases are the result of the development of living organisms, or with the other, that these organisms are merely concomitants of the diseased process, or at most only carriers of infection, we will still agree that cleanliness, temperance, fresh air, and sunlight are the influences which are best suited to limit the extension and virulence of epidemics, and to give to each individual the highest powers of resisting disease.

Notwithstanding that these influences are generally recognized as potent, the medical profession does not sufficiently insist upon their importance. Cleanliness, it is true, both of person and place, is a prominent item in medical advice. The sanitary disposal of refuse is one of the subjects that are now attracting a great share of attention, and it will not be long before extended reforms will be accomplished. Many of us may live to see the time when intelligent communities will have come to recognize the dead human body as an item of refuse, and, throwing off the sentimentalism which now surrounds the practice of burial, will have learned the proper disposal of the dead by cremation.

Microscopical research has shown that minute animal and plant forms thrive with greatest vigor in dead and decomposing material, and on the basis of this knowledge have grown up not only scientific systems of disinfection, but also many methods that are valueless

and absurd. The inventor has gotten abroad extensively in sanitary science, and the result is a long list of sewer-traps, ozonizers, disinfecting liquids, germ-killers, etc., which are liberally advertised and freely purchased. A few months ago I analyzed an ozone powder which was being sold to farmers at a rate of about one dollar per pound, and found it to contain about 90 per cent. of sulphur and 10 per cent. of charcoal, capable, therefore, of producing no ozone, and worth only a few cents. I am fully of the opinion that sanitary measures will be best carried out when we abandon all these so-called disinfectants, the majority of which are gotten up by non-scientific persons, and fall back upon the long established principles that the destructive action of heat and the diluting and oxidizing effect of fresh air are the best disinfecting agents. In regard to ozone, chlorine, and similar corrosive bodies, it cannot be denied that they exercise destructive action upon disease germs, whatever may be the nature of these germs, but to accomplish this destructive effect we must often use them in such degree of concentration that they will act injuriously upon the articles to be disinfected, and also upon the living beings of the higher order. To carry them to the extent of rendering a place safe we must generally render it uninhabitable.

It may seem like an inexcusable waste of the time of this Society to say that one of the great means of preserving health is fresh air, but few fundamental truths of science are so generally accepted and so little applied as this one. It remains a mere sentiment. How little is done by medical men in practical exemplification of the established and well-known principles of air chemistry! Among the worst ventilated rooms I have ever been in, were the lecture rooms of the college at which I received my medical degree. This indifference is the more to be regretted, since it perpetuates and intensifies wide-spread errors. The community at large entertains the belief that the open air may and often does become the active cause of disease. We live in dread of "drafts," in fear of "raw" and "night" air, and other atmospheric conditions, of which the dangers are more imaginary than real. A large number of facts are now on record which prove that exposure to the vicissitudes of the weather can be borne even by sick and injured persons, not only with safety, but with advantage; and that in some diseases this exposure seems to constitute an important assistance in the treatment. It is pleasing to see the advance that is making in the theory of the origin and nature of "colds," so long an *opprobrium medicorum.* We are now coming to the view that colds are "caught," not so much by exposure as by the want of it, and that the method of preserving the health, especially in persons

of no great heartiness, is not to keep out of the vicissitudes of the weather, but to keep in them. The deteriorating influences that affect us most are foul air, and the taking of food in excess, and of bad quality. I am not even disposed to include drinking water as so prolific a cause of disease as some are inclined to. Prof. Mallet, of the University of Virginia, has lately by his researches upset most of the modern methods of water analysis; and Blyth, an English hygienist of eminence and ability, has reported the case of a town in which the drinking water, according to all chemical and medical standards, was utterly unfit for use, and yet the average of mortality and sickness was no higher than in towns supplied with good water.

To return to the question of the effects of exposure, we may admit that the sudden and especially the unequal cooling that results from allowing a current of cold air to impinge upon a portion of the body, while the individual is inactive or overheated, may be followed by effects more or less serious, but we misinterpret the significance of this result. We fear the draft as something specifically injurious, and overlook the unfavorable conditions brought about by inaction, and the imperfections of our indoor apartments. No harm can result from the ordinary movements of air currents, or from exposure to moderately low temperature if common sense precautions are taken to protect the body from unequal cooling.

In no part of our daily life is this principle so generally disregarded as in our sleeping apartments. Almost every human being passes about one-third of his existence in sleep, and, therefore, the circumstances under which this sleep is taken must have a great influence on the health of the individual, yet it is in our sleeping-rooms that the absurd fear of drafts exercises its most baleful influence. Throughout the entire cooler part of the year, the majority of persons will be found sleeping in rooms closed tightly, or with a mere pretence of ventilation. A suggestion that the windows should be opened is met by the assertion of the danger of taking cold. Yet it is difficult to see how such can be the case, particularly as in the arrangement of the bedding, according to the American fashion, the body is well protected from sudden cooling, no part is exposed except that which is well fitted to bear the brunt of exposure, and common experience teaches us that the body is kept warm in bed more thoroughly than in our daily clothing. So far from the practice of sleeping in freely ventilated rooms being the cause of any danger from colds, it will be found to be one of the best preventives of them. I can record here the experience of two persons who have been sleeping all the last winter in a room so

arranged that they were lying in the direct line between an open door and open window, this system being carried out uninterruptedly during the coldest and stormiest weather. One of these persons has in addition followed continuously the rule of not sleeping in any clothes worn during the day, and has consequently put on cold night-clothes and gotten into a cold bed, and put on cold clothes again on getting up. All this practice, which many would think dangerous, has really been healthful and beneficial. A bold and rational system of exposure is not only preservative of health, but is a method of restoring it in the diseases which arise from overcrowding and bad ventilation. I have so much confidence in the system myself, that if, like Peter's wife's mother, I "lay sick of a fever," I should seek treatment in a room with free ventilation.

It is not proper that I should detain this Society with extended quotations from well known authors, but I cannot avoid emphasizing my opinions by one or two short allusions, taken from notes in Parkes's Hygiene.

In 1814 in an epidemic of typhus fever at Paris, some cases were placed in a building in one of the highest and breeziest parts of the city. This was done with much fear of the result, and probably only from necessity, but these cases did infinitely better than those in regular hospitals. Also in 1847–48, in Ireland, cases of an epidemic fever, treated in open air, and in the rudest sheds, recovered in larger proportions than those treated in more protected quarters.

Since 1854 the sick of the Austrian army have been largely treated during eight or nine months in the year in well-ventilated tents in preference to hospitals. The result has been beneficial both as a preventive and curative measure.

Similar experience to these cases is recorded in the reports of the late civil war in this country. Typhoid fever cases treated in tents in the field recovered in larger percentage than those treated in the finely arranged city hospitals.

"Night air" is another bugaboo, which keeps many a person indoors, to the detriment of health. Nightfall brings with it a few atmospheric changes, such as fall in temperature and increase in dampness, but changes in both these respects occur during the daytime to a much greater degree without exciting alarm. Our fear of night air is largely sentimental; the effect of the darkness and quiet on the mind, and the dangers of exposure after dark, against which invalids are so generally warned, are imaginery. I was glad to hear Dr. Carl Seiler say some months ago in a discussion at the Philadelphia County Medical Society that he had found that persons who, by reason of their daily duties, could take exercise in the open

air only at night, progressed as favorably as those who exercised during the day, and this expression in reference to a single class of cases will be found generally applicable.

We have witnessed of late years an extended discussion of the dangers of sewer-gas. When obscure or strange diseases appear in any locality, inquiry is at once directed to the drainage, and in view of the general carelessness in house construction, the search for defects is generally successful, and this defect is at once assigned as the cause of disease. Yet upon the same method we could show that such diseases were caused by leaks of gas-pipes, for these will be found when looked for. Our attention is attracted forcibly to those cases in which disease is associated with the escape of sewer-air, and we overlook the large number of cases in which defective drainage exists without producing disease. The point of hygienic importance is, however, in the fact that when we detect sewer-gas in a house the danger is not in the bad air which is getting in, but in the bad air which is not getting out. The indication is not expensive plumbing, nor patent traps, nor fancy disinfectants, but to open the windows and keep them open, and in winter to make our stoves and lights efficient ventilators. We are threatened at the present time in Philadelphia with a "plumbers' law," under which are to be appointed inspectors and sub-inspectors to harass us with fine-spun regulations and arbitrary opinions.

In short, experience leads us to the view that man (indeed also the lower animals) is fitted to endure the ordinary influences of nature; that in shutting himself up in houses, factories, etc., he departs from the normal condition and suffers the penalty. While we may hesitate to accept some of the modern views of the specific nature of disease and many of the theories of its origin, we will generally allow that outdoor nature is the friend of health, and that even where disease may apparently arise from outdoor conditions, the originating cause has been in the depressed state of the system brought about by violations of the laws of air-cleanliness and air-renewal. Under these views we will dismiss our fears of "drafts" and "colds," of "night air" and "sickly weather," and gain confidence in the Hygiene of Exposure.